

### ABSTRACT

A hard disk drive that controls the movement of a head to an off-disk position while minimizing impact between an actuator arm and a crash stop of the drive. The disk drive includes a control circuit that can perform an off-disk routine that moves the head from a middle diameter to an outer diameter of the disk. Movement of the head across the disk can be accomplished with feedback information from Gray codes of the disk, or a back emf of the voice coil motor that moves the actuator arm. The head is then decelerated as the actuator arm moves toward the crash stop. This deceleration minimizes the impact between the actuator arm and the stop.